i-PRO SmartHD

720P,indoor vandal

WV-SF346

SVGA, indoor vandal

WV-SF342

Security & AV Systems Business Unit
Panasonic System Networks Company

WV-SF342/346 Overview

i-PRO SmartHD

WV-SF342

800x600, 30fps

Simple D/N

Focus Assist

Face Detection

WV-SF346

HD/ 720P, 30fps

Simple D/N

Lens ABF

Face Detection

■ Key Features

- Real time HD/720P video with H.264 High Profile format
- High sensitivity: WV-SF342 : 0.2 lux @ color mode
  WV-SF346 : 0.3 lux @ color mode
- On-device analytics

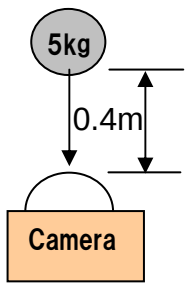
Vandal Resistant

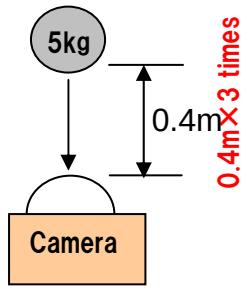
IEC Standard for Impact resistant test :
Regarding the Indoor vandal, we verified the IEC 62262(IK10) and IEC 60068-2-75 test Eh, 20J of impact resistant test.

Body: Metal

Dome: Polycarbonate

WV-SF342/346:
IEC 62262 => IK10
IEC 60068-2-75 test Eh, 20J





Weight (5kg)
The top figure: SR50

Instrument for Impact test

IEC 62262*	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10	
Impact energy (J)	0.14J	0.2J	0.35J	0.5J	0.7J	1J	2J	5J	10J	20J	
Free fall (times)	5	5	5	5	5	5	5	5	5	5	
IEC 60068-2-75**	0.14J	0.2J	0.35J	0.5J	0.7J	1J	2J	5J	10J	20J	50J
Free fall (times)	3	3	3	3	3	3	3	3	3	3	3

I*IEC 62262 (=originally defined in European Standard BS EN 50102:1995)
Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)

****IEC 60068-2-75:1997** (=JIS C 60068-2-75:2004)
Environmental testing - Part 2-75: Tests - Test Eh: Hammer tests

Physical size of each dome camera

	Φ (mm)	Height (mm)	Dome (mm)
HCM705	111	73	62
NF302	124	135	83
SF330 Series	129.5	93	80
SF340 Series	132	105	83
NW502	192	146	105

HCM705

NF302

SF330Series

SF340Series

NW502 Series

Compared with SF340 and SF330

Basically, the both models is same specification regarding the electrical and software except mechanical parts

	SF340 Series	SF330 Series
Vandal resistant	IEC 62262 : IK10 IEC 60068-2-75 test Eh, 20J	IEC 62262 : Less than IK07
Physical size		

The SF340 series has an ability of vandal resistant more than 10 times compared with the SF330 series as below table.

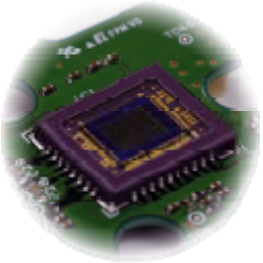
IEC 62262*	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10	
Impact energy (J)	0.14J	0.2J	0.35J	0.5J	0.7J	1J	2J	5J	10J	20J	
Free fall (times)	5	5	5	5	5	5	5	5	5	5	

Appendix

Panasonic Technology

i-PRO SmartHD

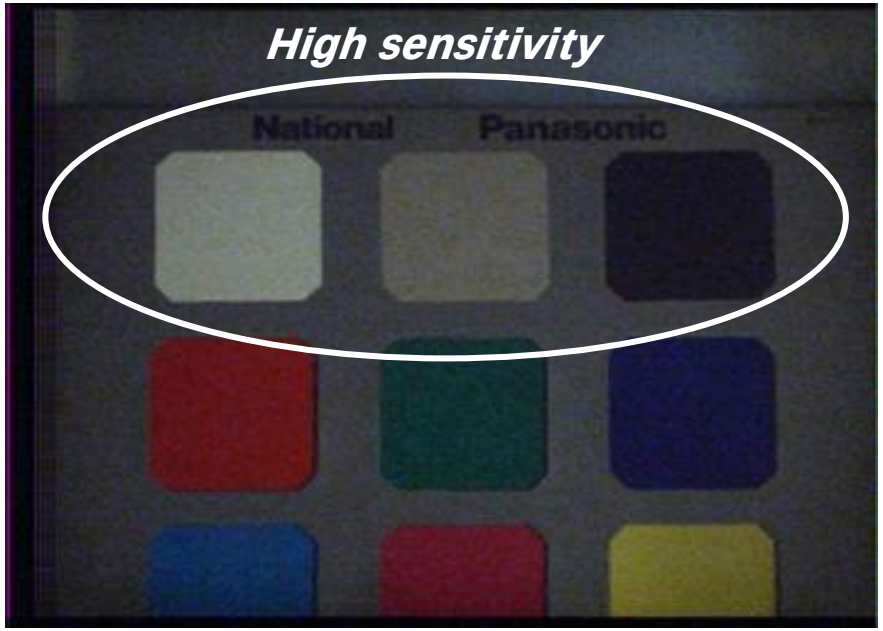
1.3 Megapixel RGB MOS Sensor



- High sensitivity (Min. illumination: 0.3lux)
- Low Power Consumption (Reduce 50% Power Consumption)
- Superior Color Reproduction by Primary (RGB) Color Filter

Low Light Condition Image (Same illumination)

Conventional MOS image

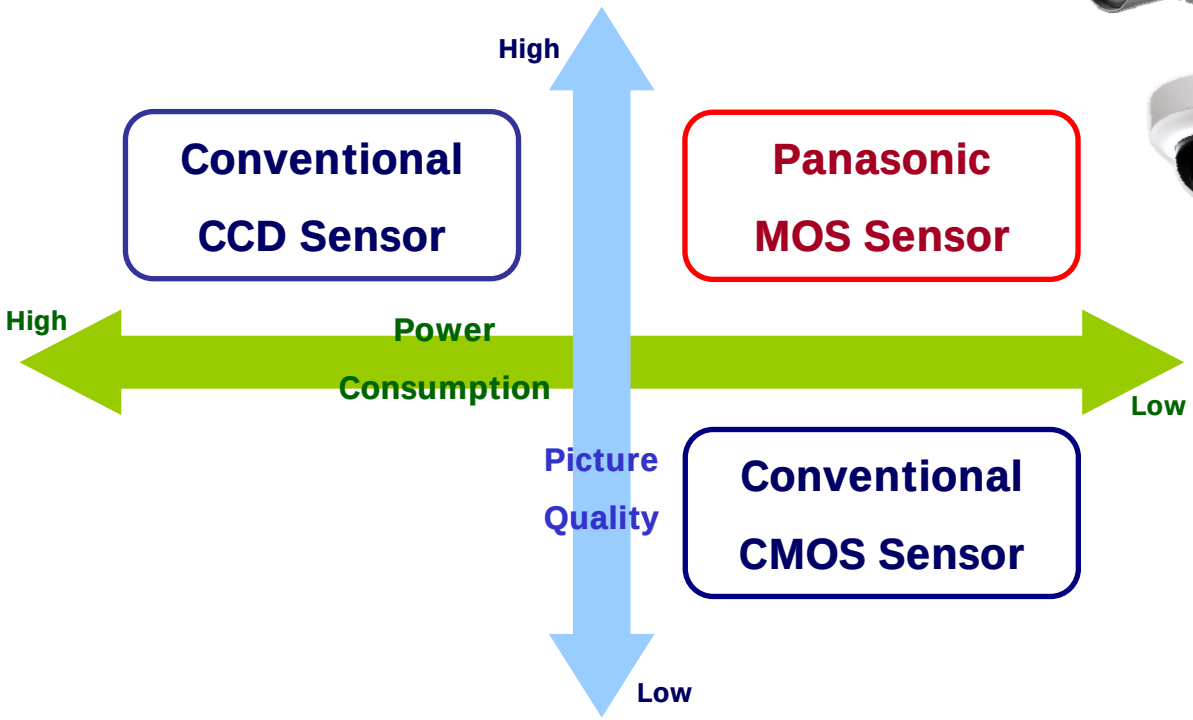


New MOS image (reference)

SF342 SF346

Panasonic MOS Sensor - 1

Panasonic develops new original MOS sensor, and implement it in SP/SF series camera, and the sensor achieves both high sensitivity & low power consumption of CCD & CMOS sensor advantages.



Panasonic MOS Sensor - 2

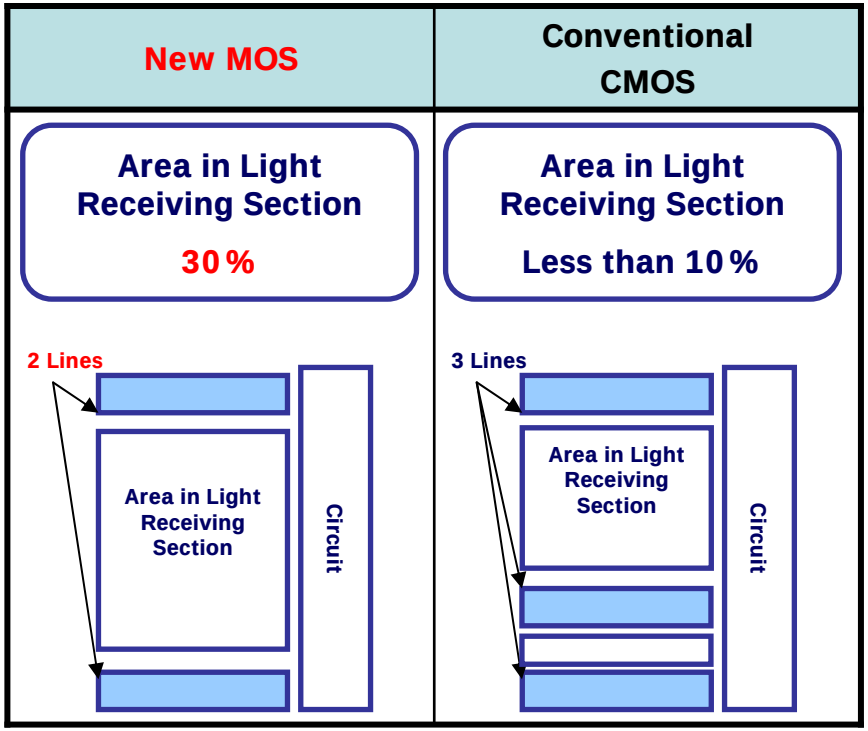
Panasonic MOS sensor has original pixel architecture technology for high sensitivity & lower noise in darker condition as the followings:

・To take wide area in light receiving section by reducing 3 lines of CMOS to 2 lines architecture.

・To reduce dark current by improving photodiode device architecture.

Light Receiving Architecture

New MOS	Conventional CMOS
Area in Light Receiving Section 30 %	Area in Light Receiving Section Less than 10 %



Photodiode Device Architecture

New MOS	Conventional CMOS
Dark Current 60 electrons/s	Dark Current 1500 electrons/s

Panasonic ideas for life

SF342 SF346

CMOS vs CCD Sensor

i-PRO SmartHD

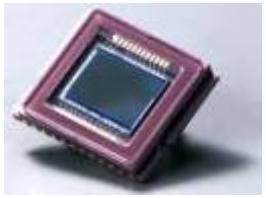
i-Pro 2nd Generation

Sensor	CCD	Conventional CMOS
Sensitivity	Better	Less
Fix Pattern Noise	Lower	Visible
Moving Object Distortion	No	Visible
Smear	Less (in case FIT)	No
Power Consumption	Higher	Lower
Cost	Higher	Lower

- CMOS can be higher density with lower cost and may be suitable for low cost market with low quality.
- However for general surveillance purpose, CCD will be the **best choice** in total performance.

Adapt & Implement CCD Sensor

in Panasonic Camera



CCD Sensor

MOS vs CCD Sensor

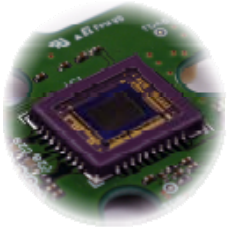
i-PRO SmartHD

i-PRO 3rd Generation

Sensor	New MOS	CCD	Conventional CMOS
Sensitivity	Much Better	Better	Less
Fix Pattern Noise	Much Lower	Lower	Visible
Moving Object Distortion	Lower	No	Visible
Smear	No	Less (in case FIT)	No
Power Consumption	Lower	Higher	Lower
Cost	Lower	Higher	Lower

- Panasonic develops new MOS sensor for high sensitivity & lower noise by latest SC processing lower noise & by original amplifier technology.
- Currently for general surveillance purpose, new MOS sensor will be the **best choice** in total performance.

Adapt & Implement New MOS Sensor in Panasonic Camera



New MOS Sensor

Panasonic ideas for life

SF342 SF346

Panasonic Technology

i-PRO SmartHD

UniPhier (Original System LSI)

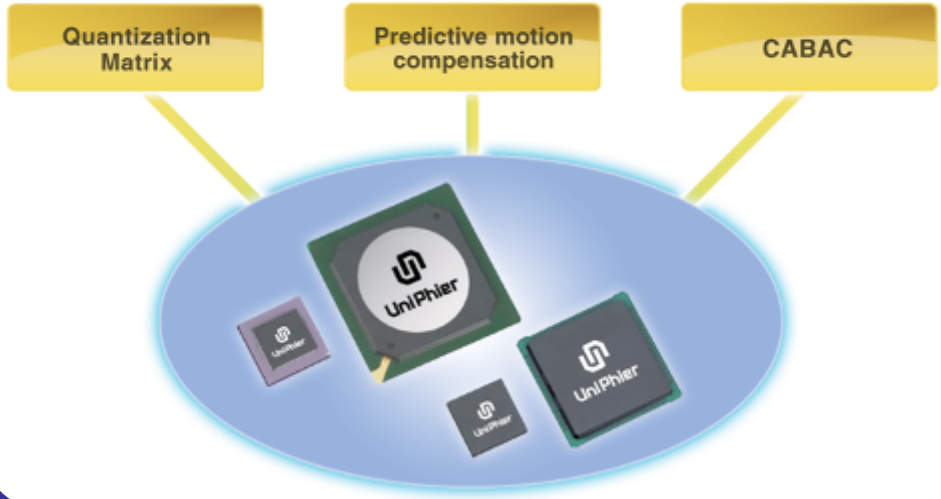
- Multiple H.264 High Profile Streams
- Real Time HD Video Processing
- On-device Intelligence Support

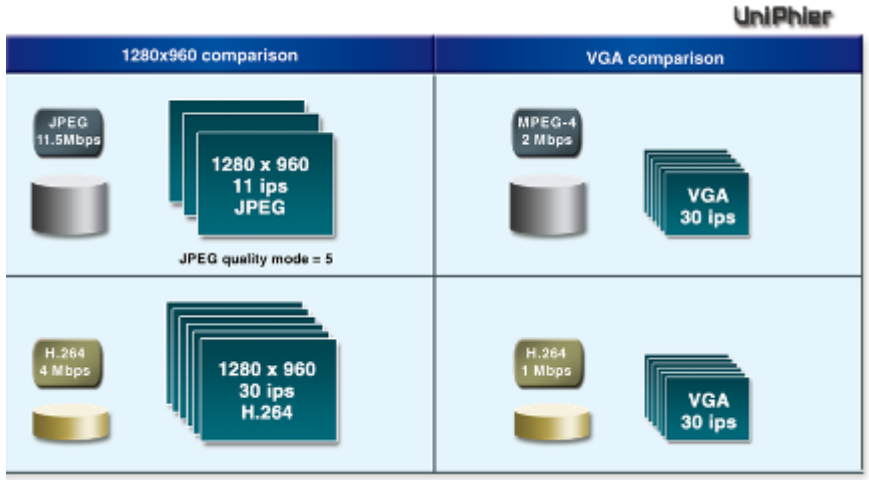
H.264 profiles

H.264 High Profile encoding with Panasonic Uniphier LSI enables

1280 x 960 high quality real time video with smaller data size.

UniPhier H.264 High Profile





* Superior image and high frame rate with smaller data size.

Panasonic ideas for life

SF342 SF346

High Definition

It improves picture resolution from standard definition to high definition.

Analog Camera

i-Pro SmartHD Camera

* SP305/306 & SF335/336 support high definition.

Progressive Scan

Progressive video output ensures clear images with less motion blur and no tearing even when the subject is moving.

Image appears with tearing when the subject is moving due to temporal difference between odd/even field.

There is no tearing even when the subject is moving.

Wide Dynamic Range - 1

i-PRO SmartHD

It expands dynamic range by tuning gain control, gamma control and dark area calibration.

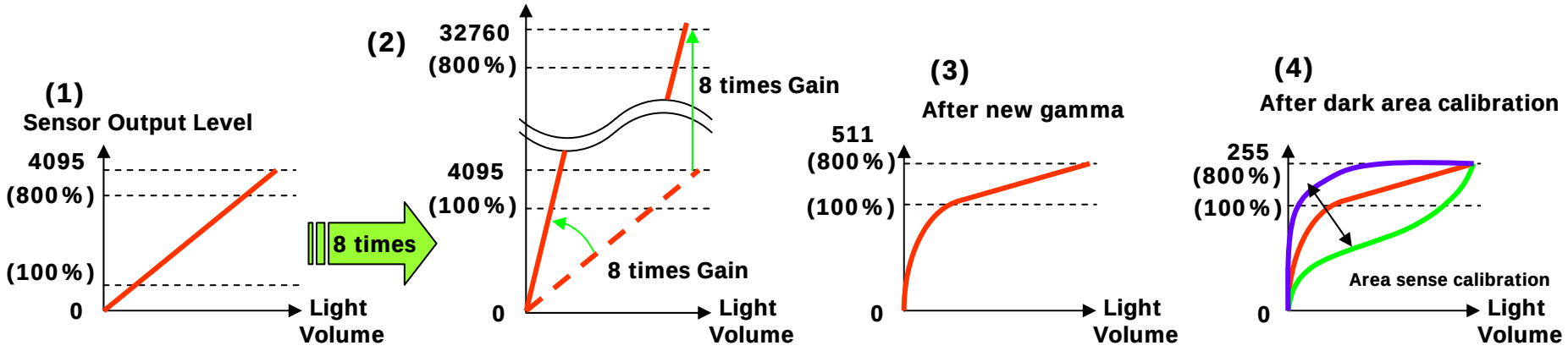
Wide Dynamic Range OFF

Wide Dynamic Range ON

Wide Dynamic Range - 2

Wide Dynamic Range Mechanism

1. Adjust lens iris until bright area is saturated.
   -> The areas that have less than normal brightness become darker.
2. Amplify signals digitally until normal level in the areas that became darker.
   -> Amplify signals even in bright areas up to 8 times.
   Note: Signal noise is increasing in dark areas, since it is without shutter control and it just amplifies signal in the dark areas.
3. Calibrate gamma included knee characteristic by amount of signal amplifying.
   -> It is possible to control bright areas and bright conditions.
4. Make image clear by accentuating contrast as well as dark area calibration.

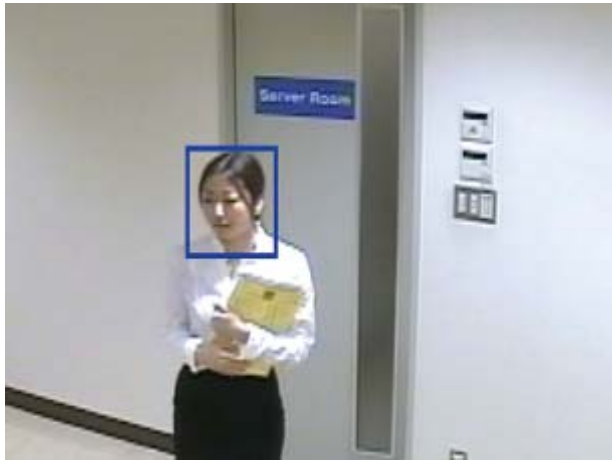


Face Detection

i-PRO SmartHD

It automatically detects up to 8 faces, and transfers face data as XML.
It enables to develop custom applications such as NV200 recorder.

Automatic Face Detection

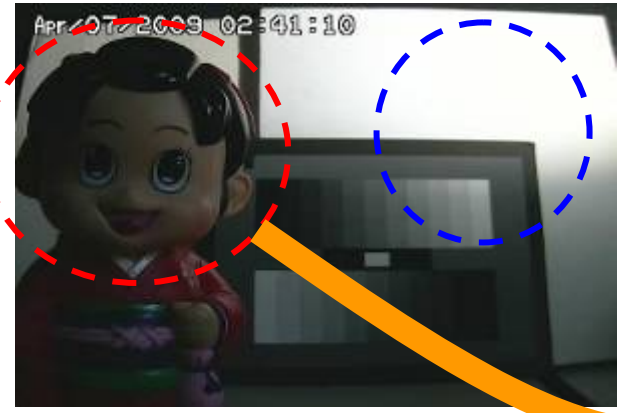


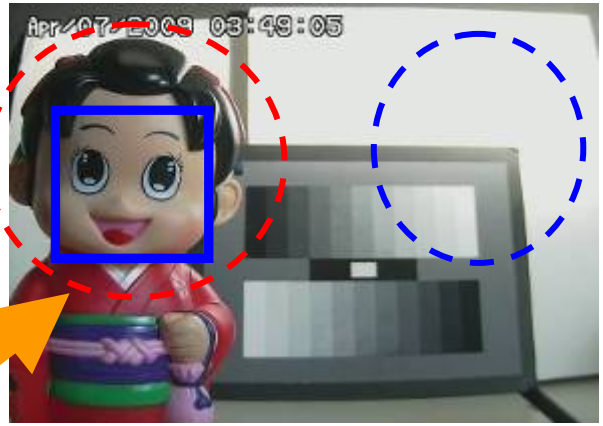
* Face detection is not handled as an alarm source.

Face Detection with WDR

i-PRO SmartHD

It automatically detects human faces and makes brightness adjustment to provide better identification for the faces by brightness calibration of human faces in backlight condition.





Before Calibration

To recognize a face is difficult because of backlight.
Camera is adjusted from bright section circled in blue.

After Calibration

Overall brightness level is increased without causing the saturation in the originally bright section (blue circle).

Wide Dynamic Range OFF

Wide Dynamic Range ON

Face Detection with Wide Dynamic Range ON

* When face detection with WDR works, it just adjusts dynamic range, and bright area may be saturated by light condition around a face.

Face Wide Dynamic Range

i-PRO SmartHD

Camera automatically turn ON or OFF face WDR function by detecting whether human faces are there or not

WDR Setting	WDR : OFF Face WDR : OFF	WDR : ON Face WDR : OFF	WDR : ON Face WDR : ON
With Human Face			
Without Human Face			

Without human face, face wide dynamic range is not operated.

Face Matching

The information of position detection of human faces and information is sent by XML form with video stream. And, it enables the matching of human face data in real time.

Automatic Face Detection

1.
Face registration

2.
Detect the face

3.
Recognize the face and send alarm

* Necessary to integrate with SmartHD Recorder (NV200 Series).
* NV200 requires SXVGA resolution for face matching, so SF342 is excluded as cameras for face matching.

High Sensitivity

i-PRO SmartHD

It improves low illumination performance even in darker condition.

Conventional HD Camera

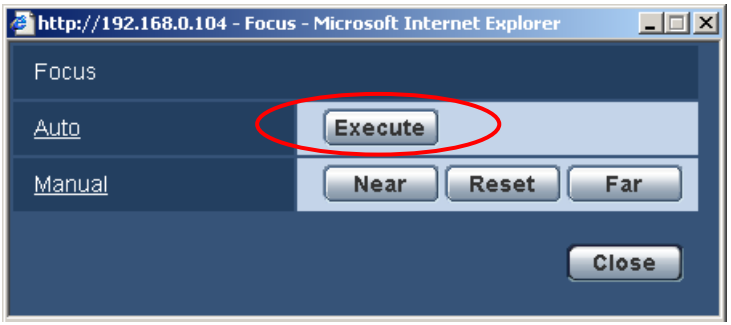
i-Pro SmartHD Camera

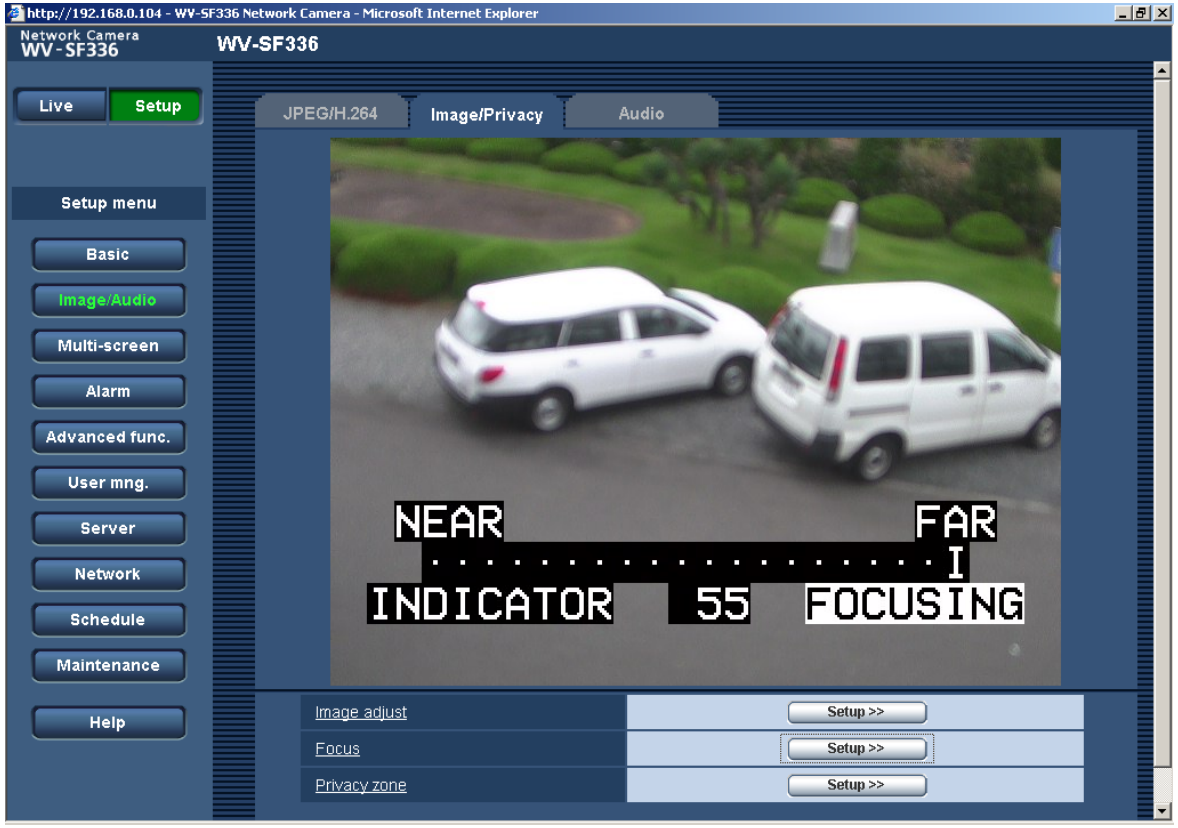
* SF346 support HD high sensitivity.

Lens ABF

SF346 has lens ABF function which is very useful for easy installation.
Lens ABF means just “Auto Focus.”

After pushing “Execute” button, focus adjustment will run automatically.





* SF346 supports lens ABF function.

Focus Assist

Focus Assist is used is for easy, accurate and illumination independent focus adjustment.

After pushing button, focus indicator will appear.

Adjusting the focus

Best focus position is found

* SF342 support focus assist function.

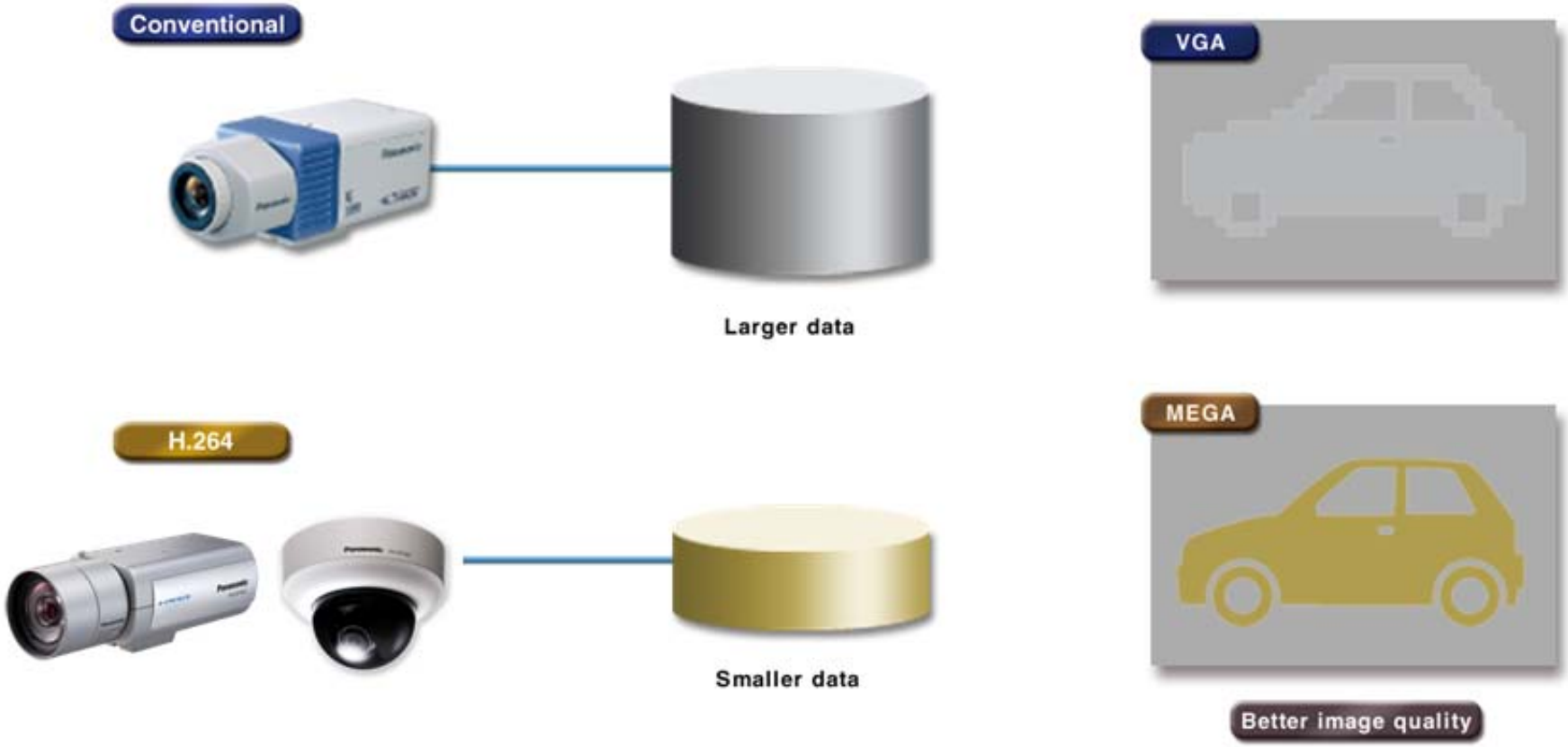
Adaptive DNR (Digital Noise Reduction)

i-PRO SmartHD

2D-DNR for motion area and 3D-DNR for static area are effectively combined, realizing a clear low noise image with less motion blur and resolution deterioration.

H.264 Latest Encoding - 1

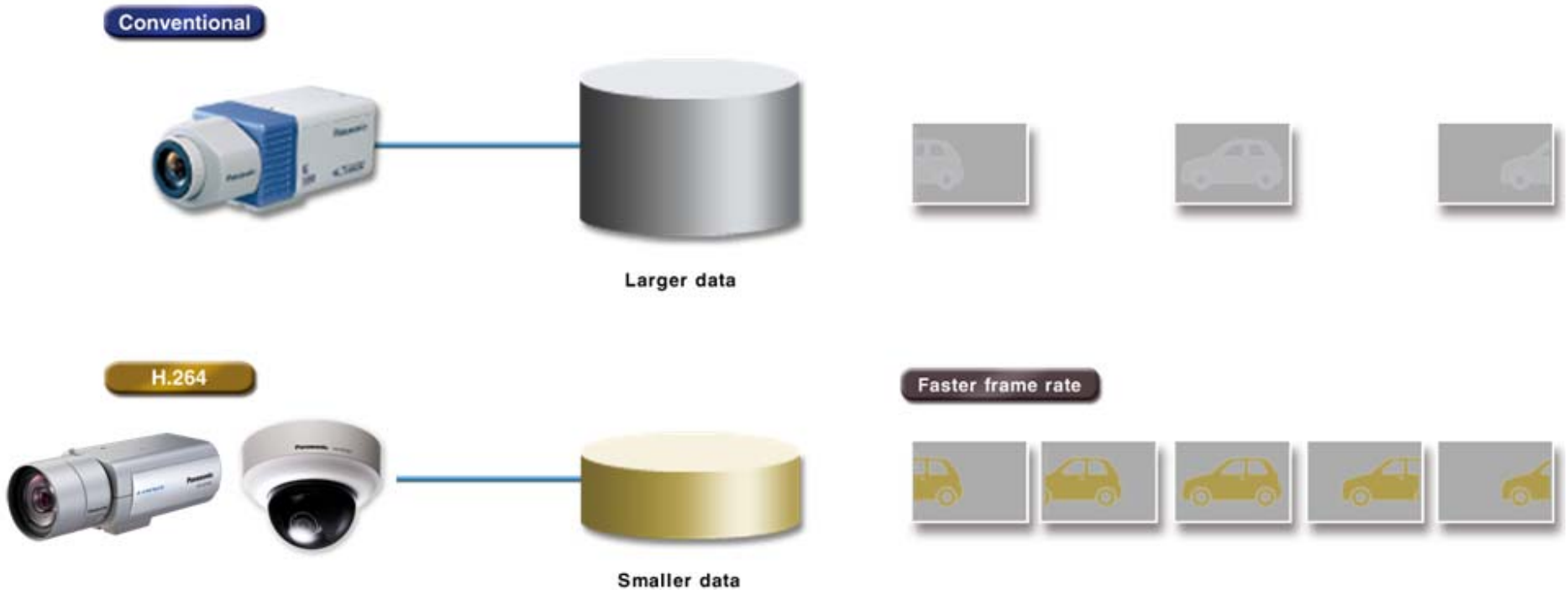
H.264 latest encoding technology with Panasonic Uniphier platform enables superior image of 1280 x 960 with smaller data size.



* This allows better image quality within the limited network/disk capacity.
SF346 supports H.264 encoding at a megapixel resolution.

H.264 Latest Encoding - 2

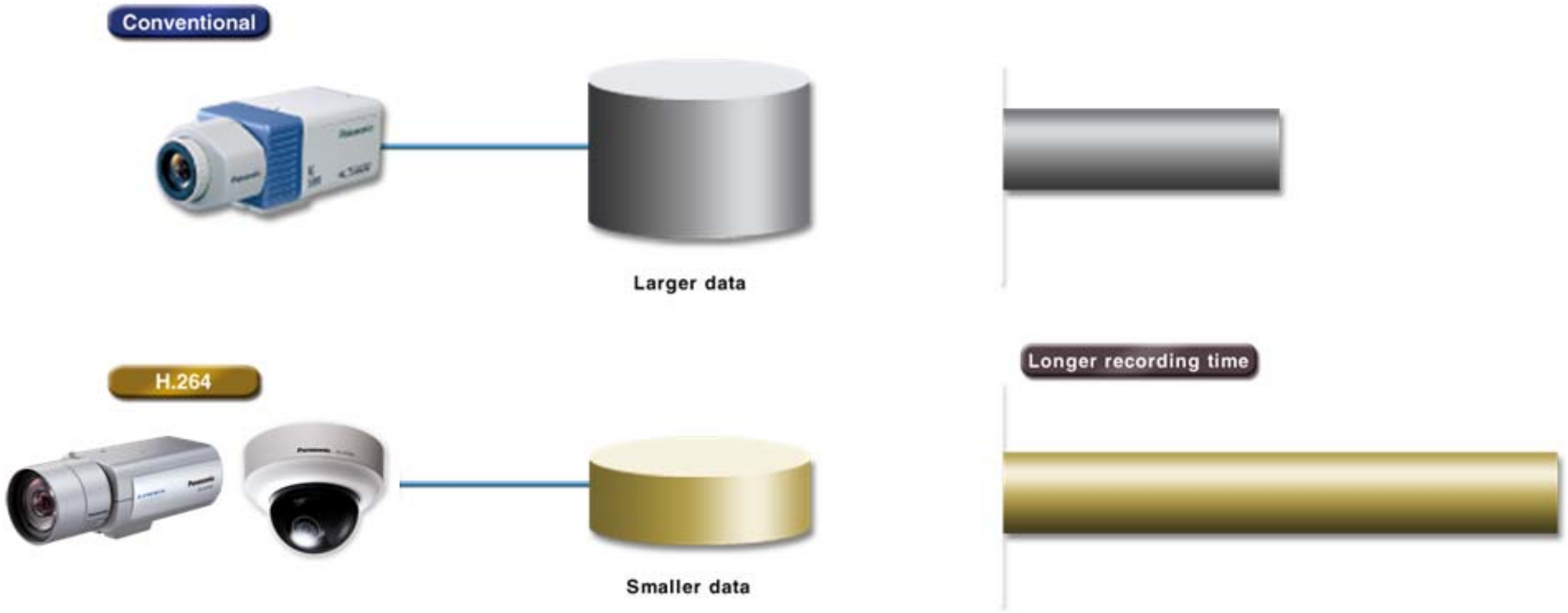
H.264 latest encoding technology with Panasonic Uniphier platform enables superior image of 1280 x 960 with smaller data size.



* This allows better image quality within the limited network/disk capacity.
SF346 supports H.264 encoding at a megapixel resolution.

H.264 Latest Encoding - 3

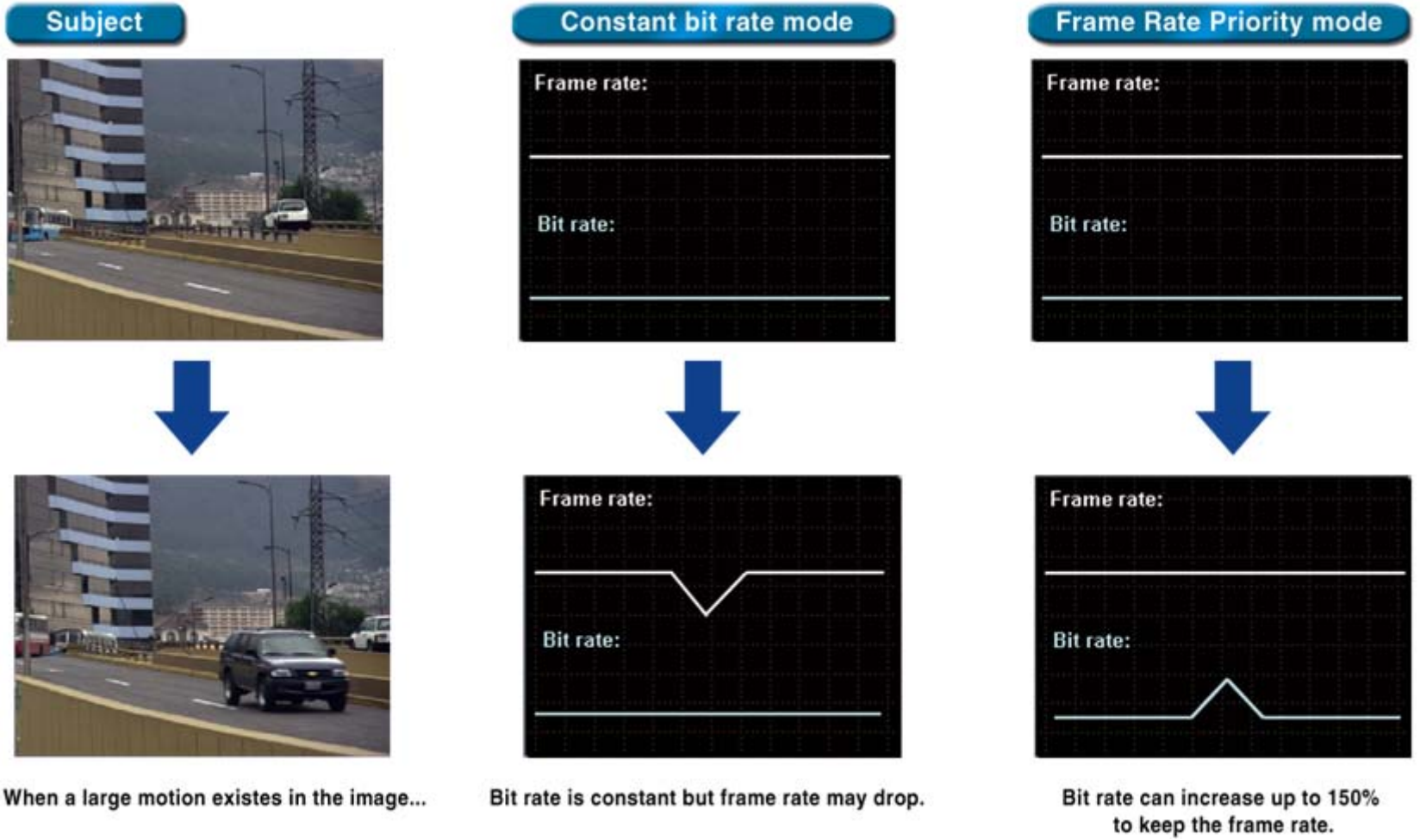
H.264 latest encoding technology with Panasonic Uniphier platform enables superior image of 1280 x 960 with smaller data size.



* This allows better image quality within the limited network/disk capacity.
SF346 supports H.264 encoding at a megapixel resolution.

Frame Rate Priority Mode

Frame rate priority mode dynamically controls bit rate depending on the subject to maintain the frame rate.



* This mode does not always guarantee the frame rate.

Multiple Streaming – 4:3 ratio

i-PRO SmartHD

Triple streams(4:3 aspect ratio) including JPEG and H.264(2ch) or MPEG4(2ch) can be transmitted simultaneously, enabling both real time monitoring and high quality recording.

JPEG

Up to 5fps@1280x960

Up to 30fps@VGA

High Resolution Recording

H.264(2):VGA or QVGA
MPEG-4(2):VGA or QVGA

30fps Recording

H.264(1):1280x960 or VGA or QVGA
MPEG-4(1):VGA or QVGA

* In case of SP302 & SF332, it supports 800x600 instead of 1280x960 resolution.

Up to 30fps @1280x960

Real Time Monitoring

* When motion stream 1 is H.264 or MPEG-4, motion stream 2 must be H.264 or MPEG-4 (same compression type). Total bit rate must be less than camera's max performance. Detail of the streaming combination is under study.

Multiple Streaming – 16:9 ratio

i-PRO SmartHD

Triple streams(16:9 aspect ratio) including JPEG and H.264(2ch) can be transmitted simultaneously, enabling both real time monitoring and high quality recording.

* In case of SP302 & SF332, it does not support 1280x720 resolution.

* Total bit rate must be less than camera's max performance. Detail of the streaming combination is under study.

SD Memory Recording

SD/SDHC Memory card slot for manual recording (H.264/JPEG), alarm recording (H.264/JPEG) and backup upon network failure (JPEG).

SD Memory Setting

1. Select image format
- **JPEG**
- **H.264**

*** In case selecting H.264, H.264 (2) streaming is used only for SD memory recording. In case using recorder backup upon network failure, select JPEG.**

2. Select recording mode
- **JPEG :Manual REC / Alarm REC (Post) / Backup upon network failure (FTP error)**
- **H.264 :Manual REC / Alarm REC (Pre / Post)**

3. Select recording setting
- **Resolution :**
  - **4:3 mode :1280x960 / VGA / QVGA**
  - **16:9 mode :1280x720 / 640x360 / 320x180**
- **Frame Rate / Bit Rate**

*** In case of H.264, the setting for H.264(2) will be changed to the SD memory recording setting.**

4. Select data size setting in pre / post alarm for H.264
- **Pre-Alarm :ON (data size: up to 2Mbps) / OFF**
- **Post-Alarm:10s – 300s**

*** In case of H.264, video data is recorded in the MP4 encoding format.**

Video Motion Detection

The motions in the specified areas can be detected, triggering an alarm.

Up to 4 areas can be registered. Finer tuning is possible with area and sensitivity adjustment.

Up to 4 areas can be set.

Detection size; When smaller, sensitivity becomes higher.

Sensitivity: Low to High

Panasonic ideas for life

SF342 SF346

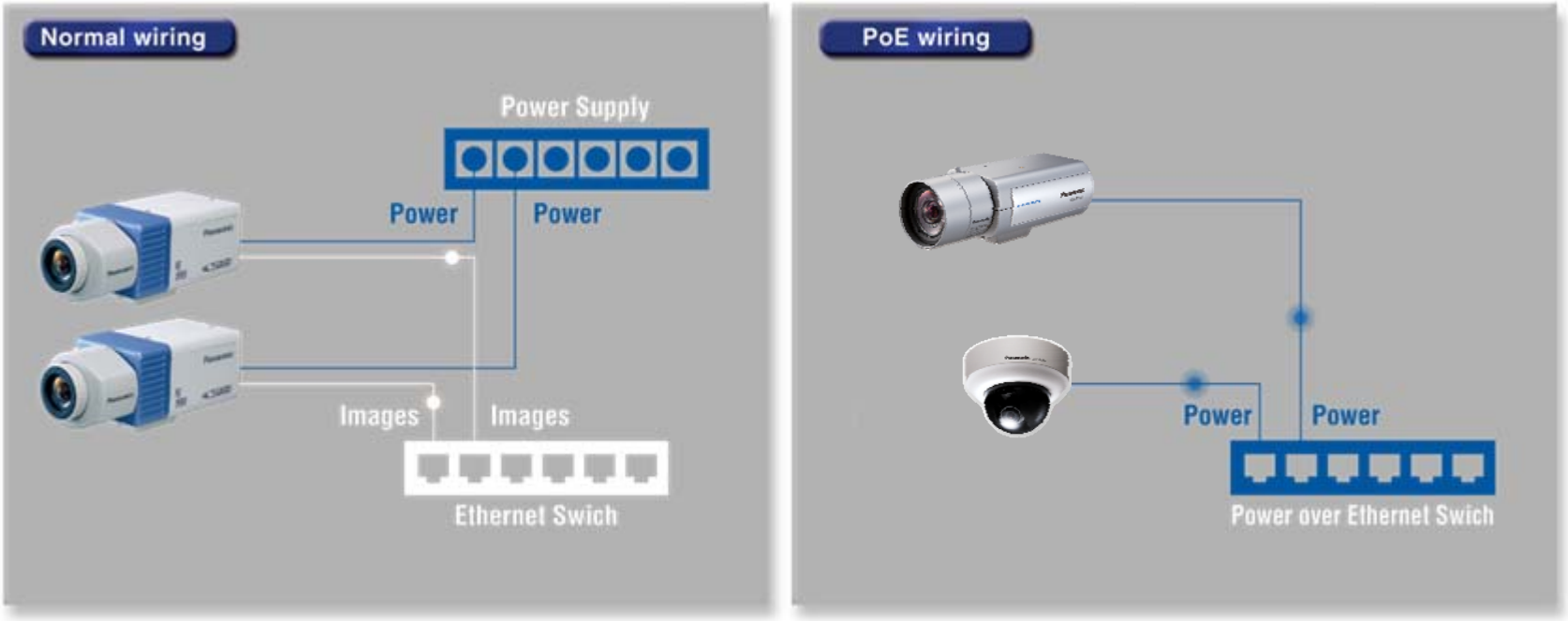
Flexible alarm handling

Alarm sources including Terminal input, VMD and Panasonic alarm command can trigger actions such as SD memory recording, FTP image transfer, E-mail notification, Indication on browser, Alarm terminal output, and Panasonic protocol output.

PoE (Power over Ethernet)

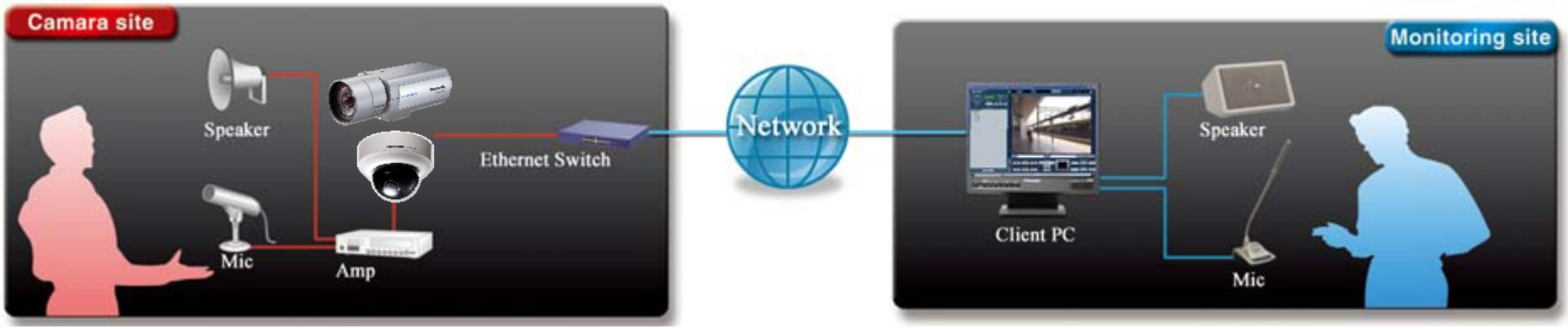
Both power and image data can be transmitted through a signal Ethernet cable.

By eliminating the need for power cables and supplies when installing cameras or changing layouts, installation and maintenance costs are reduced.



Bi-directional Audio

Full duplex bi-directional audio allows interactive communication between camera site and monitoring site.



* G.726 (ADPCM) 32 kbps mode only.

Bit Rate, Frame Rate Setting

i-PRO SmartHD

Transmission Priority is “Frame rate” (Frame Rate priority mode).

Recommended bit rate for H.264 *Refresh interval for H.264 (I frame interval) should be set 1 second.

	SXVGA(1280x960)	VGA(640x480)	QVGA(320x240)
H.264 30 fps	2,048kbps	768kbps	512kbps
H.264 5 fps	1,024kbps	384kbps	256kbps
H.264 3 fps	1,024kbps	384kbps	256kbps
H.264 1 fps	768kbps	256kbps	128kbps

H.264 requires less bit rate than JPEG for the same frame rate

H.264 is 5 time more frame rate than JPEG with the same bit rate in this case.

H.264 requires less bit rate than JPEG for the same frame rate

Bit rate for JPEG and MPEG-4

	SXVGA(1280x960)	VGA(640x480)	QVGA(320x240)
JPEG 1 fps	28KB=(1,024kbps)	48KB(=384kbps)	24KB(=192kbps)
M-JPEG 30 fps	Normal image quality: Maximum 13 fps (Low image quality : 30 fps , 13,248kbps)	11,868kbps	6,624kbps
MPEG-4 30 fps	N/A	2,048kbps	1,024kbps

*** The above recommended values change up to the object conditions and required image quality.**

H.264 : Transmission priority is “Frame rate”, possible frame rate values are shown in the table. Refresh interval is 1 second. The image quality is equivalent to normal image quality of JPEG.

M-JPEG: Normal image quality (5 of 9 levels)

MPEG-4 : Normal image quality (Constant bit rate mode), Refresh interval is 1 second.

H.264 Bit rate Comparison

i-PRO SmartHD

WV-SF342 / WV-NP502 H.264 Bit rate

Comparison is done by equivalent image quality: Normal
Camera target is moving object.

	SXVGA (1280x960)		VGA (640x480)		QVGA (320x240)	
	NP502	SP305	NP502	SP305	NP502	SP305
H.264 30 fps	2,048 kbps		1,024 kbps	768 kbps	512 kbps	
H.264 15 fps	1,536 kbps		768 kbps	512 kbps	384 kbps	
H.264 10 fps	1,536 kbps		768 kbps	512 kbps	384 kbps	
H.264 5 fps	1,024 kbps		512 kbps	384 kbps	256 kbps	

The values in red color are much better than Company A

Company A H.264 Bit rate

	1280x720*	VGA (640x480)	QVGA (320x240)
H.264 30 fps	8,196 kbps (30~26 fps)	1,536 kbps	384 kbps
H.264 15 fps	6,144 kbps	768 kbps	384 kbps
H.264 10 fps	6,144 kbps	512 kbps	256 kbps
H.264 5 fps	3,072 kbps	384 kbps	256 kbps

*As Company A doesn't have SXVGA resolution, 1280x720 resolution is measured.

The above is one of examples. The values might be different up to object conditions or required image quality.